

AMENDMENT

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A plasma processing system comprising:
 - a processing container whose inner pressure can be reduced,
 - a first electrode arranged in the processing container, the first electrode being supplied a first high-frequency electric power and a second high-frequency electric power,
 - a process gas supplying part that supplies a process gas into the processing container,
 - a tubular supporting part that supports the first electrode, the tubular supporting part forming a space together with a bottom surface of the first electrode such that said space is disposed within the tubular supporting part below the first electrode,
 - a high-frequency electric power supplying part arranged in the space, and
 - a power supply rod connecting the high-frequency electric power supplying part to the first electrode,

wherein the high-frequency electric power supplying part further comprises:

 - a first high-frequency electric power source unit that outputs the first high-frequency electric power having a first frequency, wherein the frequency of the first high-frequency electric power is higher than the frequency of the second high-frequency electric power,
 - a first matching unit directly connected to the power supply rod for impedance matching of the first high-frequency electric power,
 - a second matching unit for impedance matching of the second high-frequency electric power,
 - a coaxial tube and a filter which connect the first electrode to the second matching unit, the filter removing frequencies other than the frequency of the second high-frequency electric power, and
 - a transmission line that transmits the first high-frequency electric power from the first high-frequency electric power source unit to the first matching unit, wherein
the first matching unit is located just under the first electrode,
the second matching unit is located under the first matching unit, and

the first matching unit is arranged closer to the first electrode than the second matching unit is to the first electrode.

2. (Withdrawn, Previously presented) A plasma processing unit according to claim 1, wherein the length of the transmission line is shorter than $\lambda/2$, λ being a wavelength of the third harmonic wave of the high-frequency electric power, and with respect to the third harmonic wave of the high-frequency electric power, an output terminal of the high-frequency electric power source and an input terminal of the matching unit are electrically short-circuited ends, respectively.

3. (Previously presented) A plasma processing system according to claim 1, wherein
the transmission line has a length which is shorter than $3\lambda/4$, λ being a wavelength of a third harmonic wave of the first high-frequency electric power, and
with respect to the third harmonic wave of the first high-frequency electric power, an output terminal of the high-frequency electric power source is an electrically short-circuited end and an input terminal of the first matching unit is an electrically open end.

4. (Previously presented) A plasma processing system according to claim 1, wherein
the first high-frequency electric power source unit comprises:
a first high-frequency electric power generating part that generates the first high-frequency electric power when direct-current power is supplied thereto, and
an output filter provided between the transmission line and the first high-frequency electric power generating part, the output filter selectively allowing the first high-frequency electric power from the first high-frequency electric power generating part to pass therethrough.

5. (Currently amended) A plasma processing system according to claim 4, wherein
the first high-frequency electric power source further comprises a circulator that allows a forward wave from the first high-frequency electric power generating part to pass therethrough and that absorbs a reflected wave from the first matching unit, between the first high-frequency electric power generating part and the output filter.

6. (Canceled)

7. (Previously presented) A plasma processing system according to claim 1, wherein the first frequency is not less than 70 MHz.

8. (Previously presented) A plasma processing system according to claim 1, wherein
a second electrode is arranged in the processing container in parallel with and opposed to the first electrode.

9. (Previously presented) A plasma processing system according to claim 8, wherein
the substrate to be processed is adapted to be placed on the first electrode, and a vent hole is provided in the second electrode to jet out the process gas toward the first electrode.

10. (Canceled)

11. (Currently Amended) A high-frequency electric power supplying apparatus for use in a space in a plasma processing system that includes:

a processing container whose inner pressure can be reduced;

a first electrode arranged in the processing container, the first electrode being supplied a first high-frequency electric power and a second high-frequency electric power,

a process gas supplying apparatus that supplies a process gas into the processing container;

a tubular supporting part that supports the first electrode, the tubular supporting part forming the space together with a bottom surface of the first electrode such that the space is disposed within the tubular supporting part below the first electrode; and

a power supply rod that extends from the first electrode into the space;

said high frequency electric power supply apparatus comprising:

a first high-frequency electric power source unit that outputs the first high-frequency electric power at a first frequency,

a first matching unit for impedance matching of the first high-frequency electric power,

a second matching unit for impedance matching of the second high-frequency electric power, wherein the first frequency of the first high-frequency electric power is higher than a frequency of the second high-frequency electric power, and

a transmission line that transmits the first high-frequency electric power from the first high-frequency electric power source unit to the first matching unit, wherein:

the first matching unit is directly connected to the transmission line and directly connected to the power supply rod,

the first matching unit is located just under the first electrode,

the second matching unit is located under the first matching unit,

the first matching unit is arranged closer to the first electrode than the second matching unit is to the first electrode, and

a coaxial tube and a filter connect the second matching unit and the first electrode, the filter removing frequency components other than the frequency of the second high-frequency electric power.

12. (Withdrawn, Previously presented) A high-frequency electric power supplying unit according to claim 11, wherein the length of the transmission line is shorter than $\lambda/2$, λ being a wavelength of the third harmonic wave of the high-frequency electric power, and with respect to the third harmonic wave of the high-frequency electric power, an output terminal of the high-frequency electric power source and an input terminal of the matching unit are electrically short-circuited ends, respectively.

13. (Canceled)

14. (Previously presented) A high-frequency electric power supplying unit according to claim 11, wherein the first high-frequency electric power source comprises:

a first high-frequency electric power generating part that generates the first high-frequency electric power when direct-current power is supplied thereto, and

an output filter provided between the transmission line and the first high-frequency electric power generating part, the output filter selectively allowing the first high-frequency

electric power from the first high-frequency electric power generating part to pass therethrough.

15. (Currently amended) A high-frequency electric power supplying apparatus according to claim 14, wherein

the first high-frequency electric power source further comprises a circulator that allows a forward wave from the first high-frequency electric power generating part to pass therethrough and that absorbs a reflected wave from the first matching unit, between the first high-frequency electric power generating part and the output filter.

16. (Previously presented) A high-frequency electric power supplying apparatus according to claim 15,

wherein the first high-frequency electric power generating part is connected via a cable to a direct-current power source that converts alternating-current power of commercial frequency into the direct-current power.

17. (Canceled)

18. (Previously presented) A high-frequency electric power supplying apparatus according to claim 11, wherein

the first frequency is not less than 70 MHz.

19. (Currently amended) A plasma processing system according to claim 4, wherein

the output filter has an output terminal connected to the transmission line as an electrically short-circuited end with respect to a harmonic wave of the first high-frequency electric power.

20. (Canceled)

21. (Previously presented) A plasma processing system according to claim 1,

wherein the high-frequency electric power supplying part has three vertically-stacked

boxes; and

wherein the first high-frequency electric power source unit, the second matching unit and the first matching unit are contained in the three boxes, respectively with the second box containing the second matching unit being electrically isolated from the first and third boxes.

22. (Currently amended) A high-frequency electric power supplying apparatus according to claim 14, wherein

the output filter has an output terminal connected to the transmission line as an electrically short-circuited end with respect to a harmonic wave of the first high-frequency electric power.

23. (Canceled)

24. (Previously presented) A high-frequency electric power supplying apparatus according to claim 11, wherein

the high-frequency electric power supplying part has three vertically stacked boxes; and the first high-frequency electric power source, the first matching unit and the second matching unit are contained in the three boxes, respectively.

25. (Previously presented) A high-frequency electric power supplying apparatus according to claim 11, wherein

the transmission line has a length which is shorter than $3\lambda/4$, λ being a wavelength of a harmonic wave of the first high-frequency electric power, and

with respect to the third harmonic wave of the first high-frequency electric power, an output terminal of the first high-frequency electric power source is an electrically short-circuited end and an input terminal of the first matching unit is an electrically open end.

26. (Canceled)

27. (Previously Presented) A plasma processing system according to claim 1, wherein

the transmission line is another coaxial tube.

28. (Previously Presented) A plasma processing system according to claim 1, wherein
the first matching unit comprises an input part directly connected to the transmission line,
and a resonance rod inductively coupled to the input part to provide the first high-frequency
electric power to the power supply rod.

29. (Previously Presented) A plasma processing system according to claim 28, wherein
the first matching unit further comprises a variable capacitor connecting the resonance
rod to the power supply rod.

30. (Canceled)

31. (Previously Presented) A high-frequency electric power supplying apparatus according to
claim 11, wherein
the transmission line is another coaxial tube.

32. (Previously Presented) A plasma processing system according to claim 11, wherein
the first matching unit comprises an input part directly connected to the transmission line,
and a resonance rod inductively coupled to the input part to provide the first high-frequency
electric power to the power supply rod.

33. (Previously Presented) A plasma processing system according to claim 32, wherein
the first matching unit further comprises a variable capacitor connecting the resonance
rod to the power supply rod.